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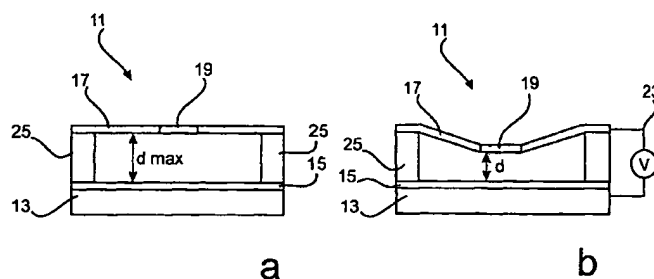
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(54) Title: **TUNABLE CAVITY RESONATOR AND METHOD OF FABRICATING SAME**



(57) Abstract: A tunable cavity resonator (11, 65) for filtering radiation in the optical and IR wavelengths and a method for fabricating same. The resonator (11, 65) having a pair of reflectors (15, 19), one (15) in fixed relationship to a substrate (27, 77) and the other (19) formed upon a suspended moveable membrane (17) disposed a cavity length (d) from the one reflector (15). The resonator (11, 65) also including a pair of spaced apart electrodes either constituted by the reflectors (15, 19) or juxtaposed therewith, which are electrostatically operable to move the membrane (17) and other reflector (19) relative to the one reflector (15). A first reflector layer is deposited on the substrate (27) to form the one reflector (15). A sacrificial layer (75) having a high etch selectivity for releasing the membrane (17, 77) in a suspended and spaced relationship from the one reflector (15) is formed on the first reflector layer. The membrane (17, 77) is deposited on the sacrificial layer (75) using a deposition technique characterised by providing the required intrinsic stress in the membrane (17, 77). A second reflector layer is formed on the membrane (17, 77) to form the other reflector (19). The second reflector layer is patterned in accordance with a prescribed membrane geometry and then etched to achieve the same. The sacrificial layer (75) is then initially etched to remove regions thereof down to the first reflector layer on the substrate (27) exposed by the etching. Those regions of the sacrificial layer that are intended to function as the residual support structure of the membrane (17, 77) are then protected with photoresist and the remaining unprotected regions of the sacrificial layer are finally etched, removing the protection from the support structures to suspend the membrane (17, 77) in substantially parallel relation to the first reflector layer.

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